Modeling Protocol Correspondence

From : <Kevin.Schilling@deq.idaho.gov>

Sent : Thursday, January 25, 2007 9:27 PM

To : <cjenv@hotmail.com>

Subject : FW: IDEQ Permit Guidance and Forms

MIME-Version: 1.0
Received: from idexfe.deq.idaho.gov ([164.165.173.34]) by bay0-mc8-f11.bay0.hotmail.com with Microsoft SMTPSVC(6.0.3790.2444); Thu, 25 Jan 2007 13:27:15 -0800
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X-Message-Info: LsUYwwHHNt1IFPe05Y6xUXypXxDnousbq42TNgu2+rE=
X-MimeOLE: Produced By Microsoft Exchange V6.5
Content-class: urn:content-classes:message
X-MS-Has-Attach:
X-MS-TNEF-Correlator:
Thread-Topic: IDEQ Permit Guidance and Forms
Thread-Index: AcdADQN/MwL10mLnSNeCaBa6cw1jYwAkcW7QAAoPW8A=
Return-Path: Kevin.Schilling@deq.idaho.gov
X-OriginalArrivalTime: 25 Jan 2007 21:27:15.0544 (UTC) FILETIME=[9592BD80:01C740C7]

Chris,

I received the ok from legal. Therefore, use of ISCST3 with the PRIME algorithm will be acceptable for this project, provided modeling of criteria pollutants are not necessary.

Please contact me if you have any other questions.

Also, I forwarded your comments on the new process to Mary Anderson. She said they were good comments, but asked if you could officially submit those comments through the comment page on the DEQ website.

Thanks,

Kevin

From: Kevin Schilling
Sent: Thursday, January 25, 2007 10:18 AM
To: 'johnson chris'
Subject: RE: IDEQ Permit Guidance and Forms

Chris,

The quick easy answer is that you have to use AERMOD, no exceptions. What I'm trying to do is find a way around that requirement since this project only involves TAPs and previous modeling was conducted for the facility using ISCST3 and approved by DEQ.

IDAPA 58.01.01.202.02 states requirements for estimates of ambient concentrations: "All estimates of ambient concentrations shall be based on the applicable air quality models, data bases, and other requirements specified in 40 CFR 51, Appendix W (Guideline on Air Quality Models)."

Section 02.a. adds, "Where an air quality model specified in the "Guideline on Air Quality Models", is inappropriate, the model may be modified or another model substituted, subject to written approval of the Administrator of the U.S. Environmental Protection Agency and public comment pursuant to Subsection 209.01.c.; provided that modifications and substitutions of models used for toxic air pollutants will be reviewed by the Department." My contention is that, in this instance, ISCST3 is more appropriate than AERMOD because Since the project only involves TAPs we don't need to get EPA approval; however, the question remains whether we need to go through public comment. I'm waiting to hear back from legal on that.

The intention of the new guidance was not to do away with modeling reports submitted as part of the application. We also realize the forms are not perfect, and we'd appreciate feedback on how should add to them or modify them.

The main thing to do with the application is to make sure all documentation on emissions rates, modeled parameters, operational rates, etc are submitted and adequately verified. When modeling sources, applicants should use typical stack gas flow rates and temperatures, not the highest flow rates and temperatures. If this is too much of a worst-case, unrealistic scenario, then the applicant may model multiple scenarios (25%, 50%, 75%, and 100% load), using emissions and stack parameters associated with each scenario. We see many generators modeled with flow rates exceeding the speed of sound and temperatures above 1000° F. I believe this is because applicants are basing temperatures on those measured at the exhaust manifold.

I will let you know about the use of ISCST3 for this project as soon as I hear back from legal.

Kevin

From: johnson chris [mailto:cjenv@hotmail.com]
Sent: Wednesday, January 24, 2007 4:12 PM
To: Kevin Schilling
Subject: RE: IDEQ Permit Guidance and Forms

Kevin,

The protocol for this project is simple. This methodology was verified as acceptable by IDEQ in the fall of 2006 when the modeling was performed. Because the application was so simple, no written documentation of IDEQ approval was requested. I was not aware at that time that the analysis would not be submitted until now. IDEQ Permit program changes force us to request formal approval again here.

The proposed action involves only one change from modeling previously submitted under an IDEQ approved modeling protocol, consistent with IDEQ recommendations, and accepted by IDEQ in a 2005 permit action.

The one change is for alternative emissions from Boiler4 only. The change will result in a net decrease for all criteria pollutants and most TAPs, but a net increase above IDEQ modeling thresholds for two TAPs. For all pollutants with net decreases, the previously supplied modeling should be conservative. For the two HAPs with increases from Boiler4 as a result of the proposed action, that source was remodeled exactly as it was in the IDEQ approved modeling protocol, the only change being the emission rates for the two TAPs. It should still be considered conservative because ISCST3 generally predicts impacts higher than AERMOD for stack sources, and the Prime downwash algorithm was used.

The bigger issue is "How do I document this consistent with the new IDEQ guidelines?" I have a modeling report written in September, but Dan wants to make this application consistent with the new IDEQ guidance. Your earlier comments indicate that my old report would be welcome, and that you do want modeling files despite the lack of requirements for them in the new process guidance. Does IDEQ need anything else to support an application under the new permitting system? New permit guidance indicates IDEQ now wants reports for TAP analyses, but only MI forms for criteria pollutant analyses, so maybe not. I don't understand the reasoning for that distinction, since most modeling analyses, unlike this one, include both criteria pollutant and TAP analyses.

Please help me verify what should be submitted. I've been trying for 3 days to find out what to do for a simple project that shouldn't take long, as soon as I can verify what IDEQ is looking for under the new permit program.

Hope you're not too buried, and that guidance, rules, and protocols under the new system are made clear, which seems like it will be a positive change.

Thank you,

...cj

Chris Johnson (208) 628-4036

8.0 Exempt Activities

The following in Table 8-1 have been identified as exempt activities with no quantifiable emissions, as defined in IDAPA 58.01.01.220. The Emission Point numbering identification is kept the same as that originally submitted by Idaho Supreme in its first Tier II Operating Permit application.

Table 8-1 Exempt Activities

Emission Point No.	Description	IDAPA Citation
1	Heating and A/C unit for office	IDAPA 58.01.01.222.02.a
2	Heating and A/C unit for office	IDAPA 58.01.01.222.02.a
3	Heating and A/C unit for office	IDAPA 58.01.01.222.02.a
4	Woman's bathroom sewer pipe vent	IDAPA 58.01.01.222.03
5	Main sewer pipe vent	IDAPA 58.01.01.222.03
6	Men's bathroom vent-air	IDAPA 58.01.01.222.03
7	Woman's bathroom vent-air	IDAPA 58.01.01.222.03
8	Men's bathroom sewer pipe vent	IDAPA 58.01.01.222.03
9	QC sink sewer pipe vent	IDAPA 58.01.01.222.03
10	QC lunchroom sink vent	IDAPA 58.01.01.222.03
11	QC area ventilation	IDAPA 58.01.01.222.02.a
12	Receiving area vent	IDAPA 58.01.01.222.02.a
13	Receiving area vent	IDAPA 58.01.01.222.02.a
14	Receiving area vent	IDAPA 58.01.01.222.02.a
15	Receiving area heater exhaust- discharge out wall	IDAPA 58.01.01.222.02.c
16	Steam quench tank exhaust	IDAPA 58.01.01.222.03
17	Peel and trim area vent fan	IDAPA 58.01.01.222.02.a
18	A & B line peeler	IDAPA 58.01.01.222.03
19	Peel and trim area ventilation fan	IDAPA 58.01.01.222.02.a
20	Fan above transformer in maintenance area	IDAPA 58.01.01.222.02.a
21	Fan, upper electrical vault, white water	IDAPA 58.01.01.222.02.a
22	Maintenance area fan	IDAPA 58.01.01.222.02.a
23	Maintenance heater exhaust	IDAPA 58.01.01.222.02.c
24	Maintenance heater exhaust	IDAPA 58.01.01.222.02.c
25	Cleaning baghouse vent (packaging)	IDAPA 58.01.01.222.02.a
26	Pulsaire discharge fan	IDAPA 58.01.01.222.02.a
27	Cooker	IDAPA 58.01.01.222.03
28	Cooker	IDAPA 58.01.01.222.03
29	Cooker	IDAPA 58.01.01.222.03
30	Cooker	IDAPA 58.01.01.222.03
31	Snifter tube	IDAPA 58.01.01.222.03
32	Snifter tube	IDAPA 58.01.01.222.03
33	Snifter tube	IDAPA 58.01.01.222.03
34	Snifter tube	IDAPA 58.01.01.222.03

Emission Point No.	Description	IDAPA Citation
35	Snifter tube	IDAPA 58.01.01.222.03
44	Snifter tube	IDAPA 58.01.01.222.03
37	Snifter tube	IDAPA 58.01.01.222.03
46	Snifter tube	IDAPA 58.01.01.222.03
52	Flash tank steam release	IDAPA 58.01.01.222.03
53	Old DA tank steam release	IDAPA 58.01.01.222.03
55	Hole	IDAPA 58.01.01.222.03
56	Hole	IDAPA 58.01.01.222.03
57	New DA tank steam release	IDAPA 58.01.01.222.03
58	Hole	IDAPA 58.01.01.222.03
59	Hole	IDAPA 58.01.01.222.03
60	Boiler blowdown tank vent	IDAPA 58.01.01.222.03
61	#1 boiler steam relief	IDAPA 58.01.01.222.03
62	#2 boiler steam relief	IDAPA 58.01.01.222.03
63	#3 boiler steam relief	IDAPA 58.01.01.222.03
64	Atmospheric bleed-stm header to atmosphere	IDAPA 58.01.01.222.03
65	#3 boiler steam relief	IDAPA 58.01.01.222.03
66	#3 boiler steam relief	IDAPA 58.01.01.222.03
67	#4 boiler steam relief	IDAPA 58.01.01.222.03
no #	Economizer water relief vent	IDAPA 58.01.01.222.03
68	#4 boiler steam relief	IDAPA 58.01.01.222.03
69	#4 boiler steam relief	IDAPA 58.01.01.222.03
70	Compressor room ventilation discharge	IDAPA 58.01.01.222.02.a
71	P6 Upper bagging baghouse discharge vent	IDAPA 58.01.01.222.02.a
72	Bagging area ventilation fan	IDAPA 58.01.01.222.02.a
73	Cooker	IDAPA 58.01.01.222.03
74	Cooker	IDAPA 58.01.01.222.03
75	Cooker	IDAPA 58.01.01.222.03
76	Cooker	IDAPA 58.01.01.222.03
77	Snifter tube	IDAPA 58.01.01.222.03
78	Snifter tube	IDAPA 58.01.01.222.03
83	Snifter tube	IDAPA 58.01.01.222.03
84	Snifter tube	IDAPA 58.01.01.222.03
85	Compressor room ventilation fan	IDAPA 58.01.01.222.02.a
86	Compressor room opening	IDAPA 58.01.01.222.03
88	Dryer gas diaphragm atmospheric vent	IDAPA 58.01.01.222.03
89	Dryer gas diaphragm atmospheric vent	IDAPA 58.01.01.222.03
92	Dryer room ventilation fan	IDAPA 58.01.01.222.02.a
93	Dryer room ventilation fan	IDAPA 58.01.01.222.02.a
94	Secondary dryer gas diaphragm atmospheric vent	IDAPA 58.01.01.222.03
95	WTP heater exhaust	IDAPA 58.01.01.222.02.c
96	WTP vacuum pump discharge	IDAPA 58.01.01.222.03
97	WTP sewer vent	IDAPA 58.01.01.222.03

Appendix A

Air Dispersion Modeling Report
February 25, 2005

AIR DISPERSION MODELING REPORT
for
IDAHO SUPREME POTATOES, INC.
FIRTH FACILITY

February 25, 2005

Prepared for:

Idaho Supreme Potatoes, Inc.
P.O. Box 70
Firth, ID 83236-0246

&

State of Idaho
Department of Environmental Quality
1410 N. Hilton
Boise, ID 83706

Prepared by:

jbr environmental consultants, inc.
7669 West Riverside Drive, Suite 101
Boise, ID 83714

7.0 Ambient Air Quality Impact Analysis

7.1 Environmental Evaluation

This report describes the results dispersion modeling conducted for Idaho Supreme Potatoes, Inc. (Idaho Supreme) Firth facility located in central Bingham County, Idaho. Idaho Supreme is submitting an application for a modification to their Tier II permit concurrently with this evaluation to increase the sulfur content of the fuel oil for Boiler #4 from 0.5% to 1.69%. Idaho Supreme is also proposing to increase the stack height of the boiler by 10 feet. Boiler #3 will operate on natural gas or propane only.

Because this proposed action represents no change in emissions for any pollutant other than SO_2 and PM-10, only the impacts of those two pollutants are analyzed. Facility characteristics, emission unit source information, and meteorological data used are described in the following sections. The input characteristics for the air dispersion model are identified. The modeling approach, receptor grid evaluation, and fence line designation are also discussed in this environmental evaluation. The modeling conducted here uses the approach recommended by the IDEQ air quality modeling program in a November 23, 2004 memo, and was prepared from input files IDEQ shared consistent with that memo and their review of earlier Idaho Supreme modeling submittals.

7.2 Summary of Required Information

Idaho Supreme's Firth facility site is located at the corner of Highway 91 and 800 North, Goshen Highway, less than 1 mile northeast of Firth. Air Quality Control Region 61 surrounding Firth (Bingham Co.) is attainment for all criteria pollutants. Bannock County, to the south is designated as non-attainment for particulate matter 10 microns in diameter or less (PM_{10}.). The UTM coordinates of this facility are UTMN: 4795^{900}, UTME 404^{800}, in Zone 12.

7.3 Emission Units

The increase in PM-10 emissions from Boiler #4 is shown to have an insignificant impact through modeling of that source alone for annual impact, and for 24-hour average on all but two days in five years (March 14, 1989, and February 16, 1990). Ambient 24-hour PM-10 concentrations as a result of all facility operations on those two days are modeled. To analyze SO_2 impacts, all facility point and stationary sources are modeled in this evaluation. All emission units are characterized in the model using their maximum production rate capacity. Please see the October 28, 2004 letter by Idaho Supreme to DEQ for a Consent Order request and previous sections in this application for operating restrictions, such as restrictions to hours of operation or fuel rate.

Updated emission calculations are included in Section 6.0 of the permit application and are generally based on EPA's Compilation of Air Pollution Factors, 5th Edition, or AP-42. Table 7-1 summarizes the emission rate increases used in this evaluation.

Table 7-1 Criteria Pollutant Emission Rate Increases

Source	SO_2 (lb/hr)	PM-10 (lb/hr)
Fluidized Bed Dryer	0.004	-
#4 Bigelow Boiler	172.5	7.11 [a]
#3 Cleaver Brooks	0.03	-
Space Heater South (SRC1)	0.06	-
Space Heater North (SRC3)	0.06	-
Space Heater East (SRC2)	0.11	-
Misc. Space Heaters (SRC4)	0.02	-
Secondary Dryer (1st vent)	0.0002	-
Secondary Dryer (2nd vent)	0.0002	-
Dryer Stage A	0.0005	-
Dryer Stage B	0.0002	-
Dryer Stage C	0.0002	-

[a] *The PM-10 modeled emission rate modeled = 13.2 lbs/hr with 1.69% sulfur fuel - currently permitted 6.1 lbs/hr with 0.5% sulfur fuel*

PM-10 emissions from all other sources (modeled for the two days with significant increases in Pm-10 impacts) are as documented to IDEQ in October and November, 2004. Fuel used for the space heaters, dryers, fluidized beds, and Boiler #3 is natural gas or propane. Boiler #4 was modeled using the worst case emissions per pollutant, based on the fuel. Fuel types that were evaluated for Boiler #4 include residual fuel, #2 diesel, natural gas, and propane.

Table 7-2 shows the stack parameters for the point and volume sources.

Table 7-2 Stack Parameters

Source	Stack Height (m)	Temp (K)	Exhaust Flow (acfm)	Stack Diameter (m)
Fluidized Bed Dryer	8.60	0	26,000	0.85
#4 Bigelow Boiler	18.29	463.56	32,000	0.91
#3 Cleaver Brooks	11.06	560.78	13,000	0.88
Secondary Dryer (1st vent)	7.68	293.00	7,000	0.76
Secondary Dryer (2nd vent)	7.68	293.00	7,000	0.76
Silo Storage A	22.43	293.00	750	5" X 10.5"
Silo Storage B	22.43	293.00	750	5" X 10.5"
Silo Storage C	22.43	293.00	750	5" X 10.5"
Silo Storage D	22.43	293.00	750	5" X 10.5"
Silo Storage E	22.43	293.00	750	5" X 10.5"
Silo Storage F	22.43	293.00	750	5" X 10.5"
Silo Storage G	22.43	293.00	750	5" X 10.5"
Silo Storage H	22.43	293.00	750	5" X 10.5"
Silo Storage I	22.43	293.00	750	5" X 10.5"
Silo Storage J	22.43	293.00	750	5" X 10.5"

Source	Stack Height (m)	Temp (K)	Exhaust Flow (acfm)	Stack Diameter (m)
Flaker #4	7.37	293.00	7,500	1.14
Flaker #3	7.37	293.00	7,300	1.14
Flaker #2	7.37	293.00	7,300	1.14
Flaker #1	7.37	293.00	7,031	1.14
Flaker #8	8.29	293.00	8,524	0.76
Flaker #7	8.29	293.00	7,500	0.76
Flaker #6	8.29	293.00	7,500	0.76
Flaker #5	7.68	293.00	7,500	0.63
Flaker #10	9.83	293.00	7,500	0.61
Flaker #9	9.83	293.00	7,500	0.61
Flaker #12	9.83	293.00	7,500	0.61
Flaker #11	9.83	293.00	7,500	0.61
Dryer Stage A	7.99	366.33	8,500	0.70
Dryer Stage B	7.99	366.33	7,500	0.70
Dryer Stage C	7.99	366.33	8,500	0.70
Space Heater South (SRC1)	7.62	310.78	70,000	Volume source
Space Heater North (SRC3)	7.62	310.78	70,000	Volume source
Space Heater East (SRC2)	7.62	310.78	130,000	Volume source
Space Heater Misc. (SRC4)	-	-	-	Volume source

7.4 Meteorological Data

The meteorological data set (METdata) used for this National Ambient Air Quality Standards (NAAQS) evaluation was supplied to Idaho Supreme by IDEQ. The 1987 through 1991 Pocatello METdata sets were collected between 1987 and 1991 was at a site approximately 23 miles to the south. The upper air station for the METdata set is registered as station 24127 (Idaho Falls) and the surface air station is designated as 24156 (Pocatello). The wind rose of these METdata sets show prevailing winds are from the southwest.

7.5 Ambient Air Standards

The air dispersion modeling effort compares Idaho Supreme's impact on the surrounding area with the PM-10 significant impact levels (SILs), IDEQ SO_2 standards and IDEQ 24-hour PM-10 standards on March 14, 1989 and February 14, 1990. Emission impacts compared to NAAQS will be to the highest 1st high for the short-term averages, and the maximum impact for the annual average. Emission impacts for comparison with the PM-10 SILs will be the highest over the five years of meteorological data.

No Class I areas within 100 kilometers of the facility were identified in this environmental evaluation. Ambient air background levels applicable to this area were added to the air dispersion model output for comparison to the IDEQ standards and NAAQS. Background concentrations used in this modeling, as prescribed by IDEQ, are shown in Table 7-3.

Table 7-3 Air Pollutant Evaluation Periods, Standards and Background Concentrations

POLLUTANT	Averaging Period	NAAQS (or SIL) ($\mu g/m^3$)	Background Concentration (ug/M^3)
SO_2	Annual 24-Hour 3-Hour	80 365 1300	8 34 26
PM-10	Annual 24-hour	1 5	73 N/A

7.6 Air Dispersion Models

The Industrial Source Complex Short-Term Version 3 (ISCST3) model, version 02035, was used for this analysis. The modeling utilized BeeLine's compilation of ISCST3, referred to as BEEST. All modeling input and output files are included on the enclosed compact disc.

7.6.1 Modeling Parameters

Modeling parameters used to approximate the emissions, terrain, and METdata are listed below in Table 7-4.

Table 7-4 Air Dispersion Modeling Settings

Parameter	Setting	Setting
	NAAQS and SIL analyses	ROI analyses
Dispersion	Rural, by Concentration	Rural, by Concentration
Anemometer Height	10 Meters	10 Meters
Fence Line (Receptor) Boundary	Property Line as indicated Site Map in Appendix B	Property Line as indicated Site Map in Appendix B
Terrain, Coordinates	Elevated, Normalized UTM Coordinates	Elevated, Normalized UTM Coordinates
Receptor Grid(s)	Dense 4712 receptor grid recommended by IDEQ with 100 Meters for Coarse Grid and extensive 25 and 50 Meter Refined Grid	500 Meter Coarse Grid out to 25 kilometers
Regulatory Options	Stack tip Downwash, Building Downwash (BPIP), Regulatory Default Options	Stack tip Downwash, Regulatory Default Options
Dispersion Output	Concentrations (ug/m^3)	Concentrations (ug/m^3)

Parameter	Setting	Setting
PRIME Option	Used, as per IDEQ recommendation	No downwash

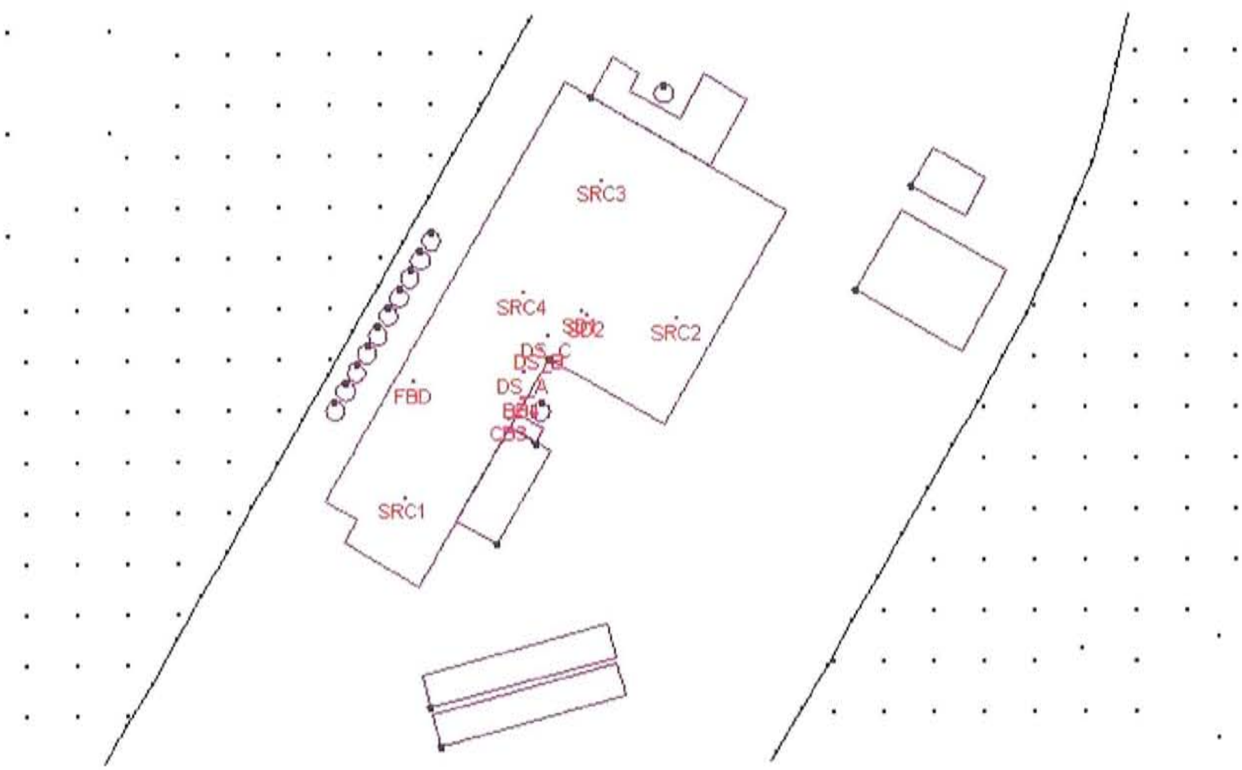
7.6.2 Modeling Approach

The approach taken with this modeling effort was to build the model using the emission rates shown in Table 7-1. Emission temperatures and exit velocities identified by Idaho Supreme and manufacturer's data were used. Additional stack parameters, building dimensions, and fence line locations were taken from facility-provided information. Terrain elevations were determined by interpolating the USGS DEMs for Firth, Idaho and surrounding areas and site plan surveys. See Appendixes A and B of the 2002 modeling report for building dimensions, fence line, site map and USGS map.

7.6.3 Receptors and File Names

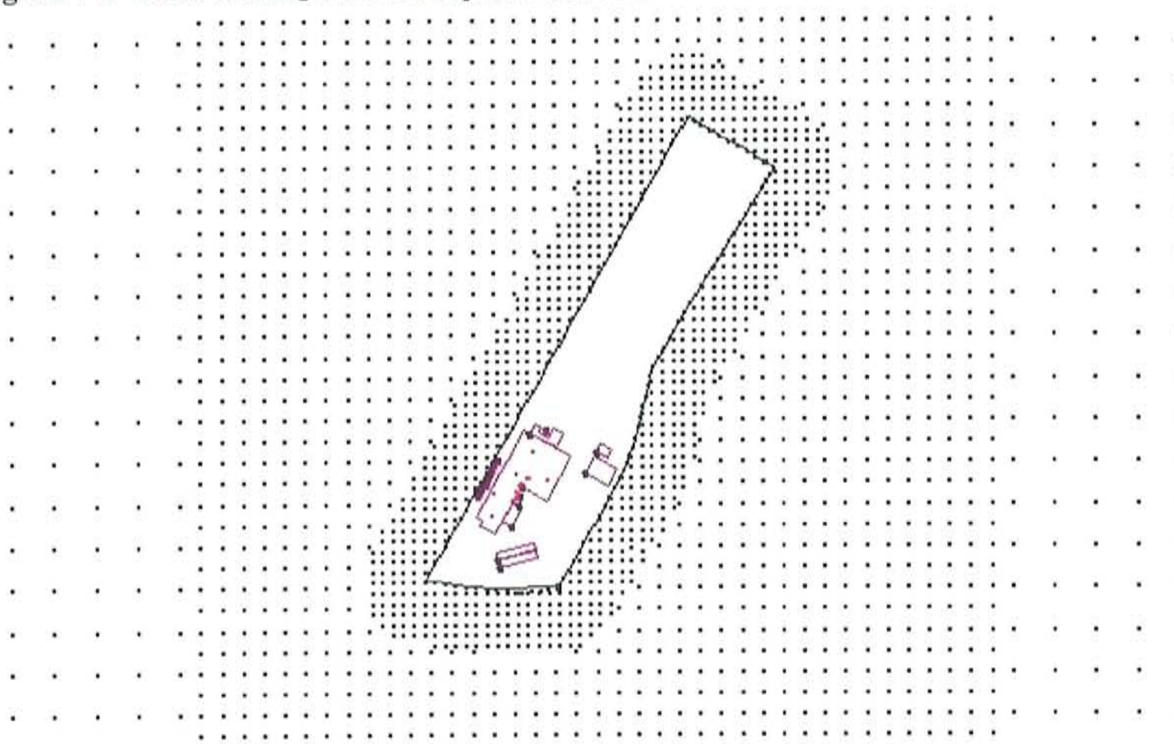
The model runs for the NAAQS and SIL analyses featured a dense fine grid receptor network prepared by IDEQ. The receptor network extended from the facility fence line out. 25 meter grid spacing was maintained along the property boundary and for 150 meters beyond. Figure 7-1 shows the model sources and the nearest ambient air boundary receptors at and beyond the property boundary.

Figure 7-2 Model Sources and NAAQS/ SIL Ambient Air Boundary Receptors



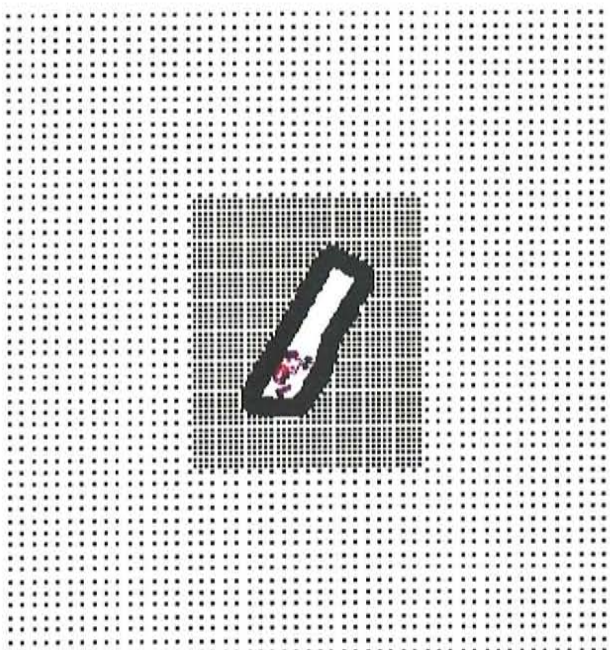
Beyond the 25 meter grid, receptors were placed with 50 meter spacing out to 500 meters. Figure 7-2 shows the inner receptor network.

Figure 7-2 Inner NAAQS/SIL Receptor Network



Beyond 500 meters, the receptor network featured 100 meter grid spacing out to 2000 meters. Figure 7-3 shows the outer model receptor network.

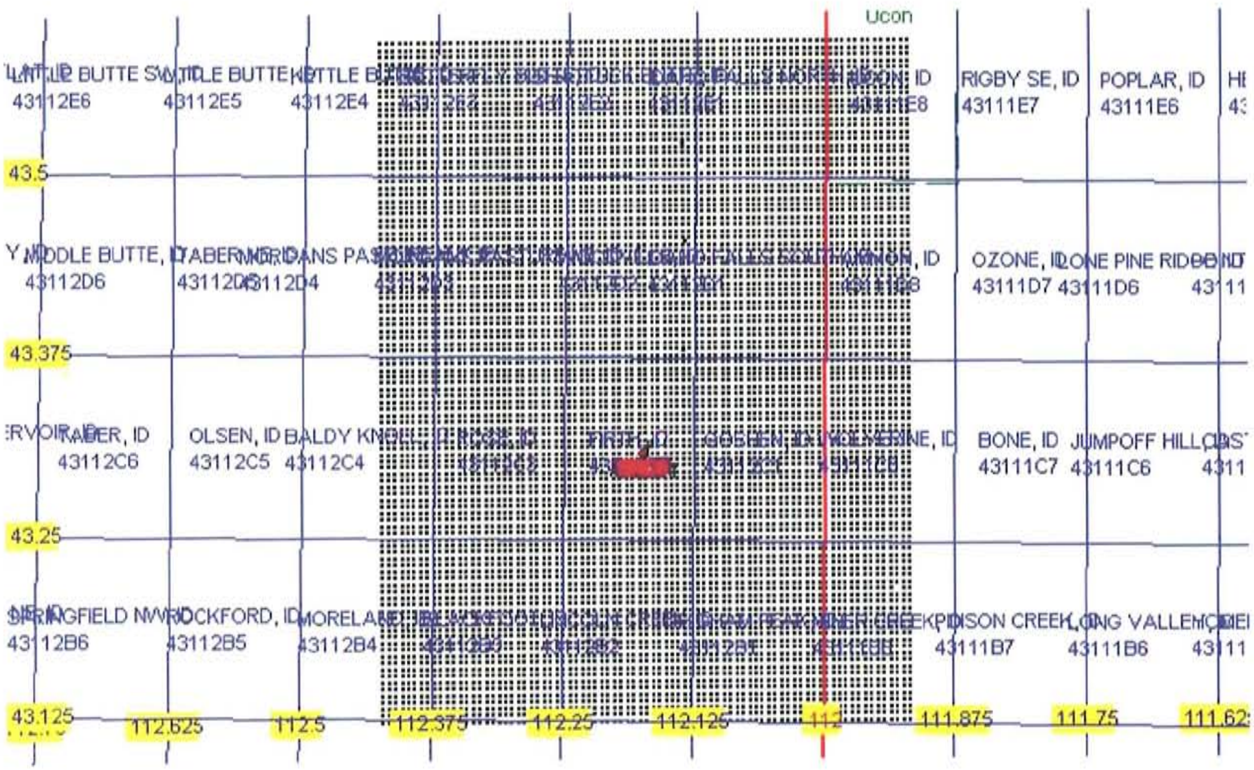
Figure 7-3 Outer NAAQS/SIL Receptor Network



All model maximum impacts occurred within the area featuring 25 meter receptor spacing, or just beyond in the first couple of rows of 50 meter grid spacing.

For the radius of impact analyses, a 500 meter receptor grid was used, as recommended by IDEQ. The receptor network was extended to 25 kilometers to bound the most distant model predicted significant impact location and verify maximum distance. Figure 7-4 shows the receptor network for the ROI analysis.

Figure 7-4 Radius of Impact Receptor Network



UTM coordinates for this effort were normalized on the south east corner of the property. UTM $N = 4795^{900} = 0.0$, and UTM $E = 404^{800} = 0.0$. This normalization was done to better locate the highest area of ambient impacts. The site map in Appendix B of the 2002 modeling report indicates the UTMN, UTME center point.

Table 7-5 identifies the computer modeling file names that are included in the electronic submittal. Computer input files for this evaluation end in the suffix; '* .DAT', output files labeled '*.LST', and downwash files end in '*.PIP' and '*.SO'.

Table 7-5 Computer Modeling File Names

File Name	Evaluation
IDSuprDEQstk169S_87_SO2, IDSuprDEQstk169S_88_SO2, IDSuprDEQstk169S_89_SO2, IDSuprDEQstk169S_90_SO2, IDSuprDEQstk169S_91_SO2,	SO_2 - 3-Hour, 24-Hour, and Annual Average impacts

File Name	Evaluation
IDSuprROI_87_SO2, IDSuprROI_88_SO2, IDSuprROI_89_SO2, IDSuprROI_90_SO2, IDSuprROI_91_SO2	SO_2 - 3-Hour, 24-Hour, and Annual Average Radius of Impact
IDSuprDEQstkdel_87_PM10, IDSuprDEQstkdel_88_PM10, IDSuprDEQstkdel_89_PM10, IDSuprDEQstkdel_90_PM10, IDSuprDEQstkdel_91_PM10	PM-10 - 24-Hour and Annual Increase in Impact
IDSuprDEQstkPM031489_89_PM10 IDSuprDEQstkPM021689_89_PM10	PM-10 - 24-Hour impacts

7.7 Results

The NAAQS modeling results demonstrate compliance with all SO_2 NAAQS with no operational restrictions. The SIL modeling results show insignificant PM-10 increases in impact. The ROI analyses show the maximum extent of significant impact for Idaho Supreme is 32.9 kilometers.

Results from this environmental evaluation are presented in the enclosed computer disk in their full EPA ISCST3 electronic format. Table 7-9 identifies the air pollutant, year of maximum predicted impact, averaging period, maximum ambient air impact, receptor location, IDEQ background concentration, and total predicted ambient concentration. The air dispersion modeling is based on 365 days of meteorological data and 365 days of emissions at the loads described in the previous paragraph.

7.7.1 SO_2 Modeling

The facility SO_2 sources were modeled for the 3-hour, 24-hour, and annual averaging times. The results are summarized in Table 7-6 below. The appropriate background concentrations have been added to determine compliance with NAAQS.

Table 7-6 Refined SO_2 Modeling Results

	Modeled Impacts (µg/m³)		
Parameter	**Annual**	**3-hour**	**24-hour**
Max. Impact Year	1,991	1,990	1,989
Concentrations	15.8	425	104
Background	8	34	26
Total µg/m³	23.8	459	130
NAAQS (µg/m³)	80	1300	365

All impacts are well below NAAQS. Because the facility has a significant impact for SO_2, additional modeling was performed to verify the radius of impact for SO_2, the maximum distance at which the facility has a significant impact.

7.7.1.1 SO_2 ROI Modeling

For each year, modeling runs were performed to estimate 3-hour, 24-hour and annual SO_2 impacts on a coarse grid of receptors covering a large area surrounding the Idaho Supreme facility. The distance to the most distant receptor for which a significant impact was observed was calculated for each averaging period. Table 7-7 shows the maximum extent of significant impact for SO_2 is 32.9 kilometers. Maximum distances to significant impact were in the northeast quadrant for all years and averaging periods.

Table 7-7 SO_2 ROI Modeling Results

Radius of Impact, in kilometers

	1987	1988	1989	1990	1991	Maximum
3-hour	29.3	28.2	26.8	32.2	27.8	**32.2**
24-hour	32.9	26.9	26.3	27.9	26.3	**32.9**
Annual	18.7	22.3	18.0	19.6	18.3	**22.3**

7.7.2 PM-10 Modeling

The changes in PM-10 impacts as a result of the proposed consent order were modeled for the annual and 24-hour averaging times. The changes resulted entirely from an increase in emissions from Boiler #4 as a result in the increase in sulfur content of the boiler fuel. The results are summarized in Table 7-8 below.

Table 7-8 Refined PM-10 Modeling Results

	Maximum Modeled Impacts ($\mu g/m^3$)	
Parameter	**Annual**	**24-hour**
Max. Impact Year	1991	1989
Concentrations	0.65	5.32[a]
SIL ($\mu g/m^3$)	1	5

a The only days from 1987 through 1991 where max i24-hour average PM-10 impact increases were above the SIL were March 4, 1989 and February 14, 1990

The changes in PM-10 impacts as a result of the proposed action are below significant impact levels (SILs) on all but the two dates documented. Further PM-10 modeling was confined to those two days.

The facility PM-10 sources were modeled for the 24-hour averaging period on March 14, 1989 and February 16, 1990. The results are summarized in Table 7-9 below. The appropriate background concentrations have been added to determine compliance with NAAQS.

Table 7-9 Refined PM-10 Modeling Results

Parameter	Modeled Impacts (µg/m³) March 14, 1989	Modeled Impacts (µg/m³) February 14, 1990
24-hour average impact	26.2	68.2
Background	73	73
Total µg/m³	99.2	141.2
NAAQS (µg/m³)	150	150

All impacts are well below NAAQS.

A summary of the modeling results is shown in Table 7-10.

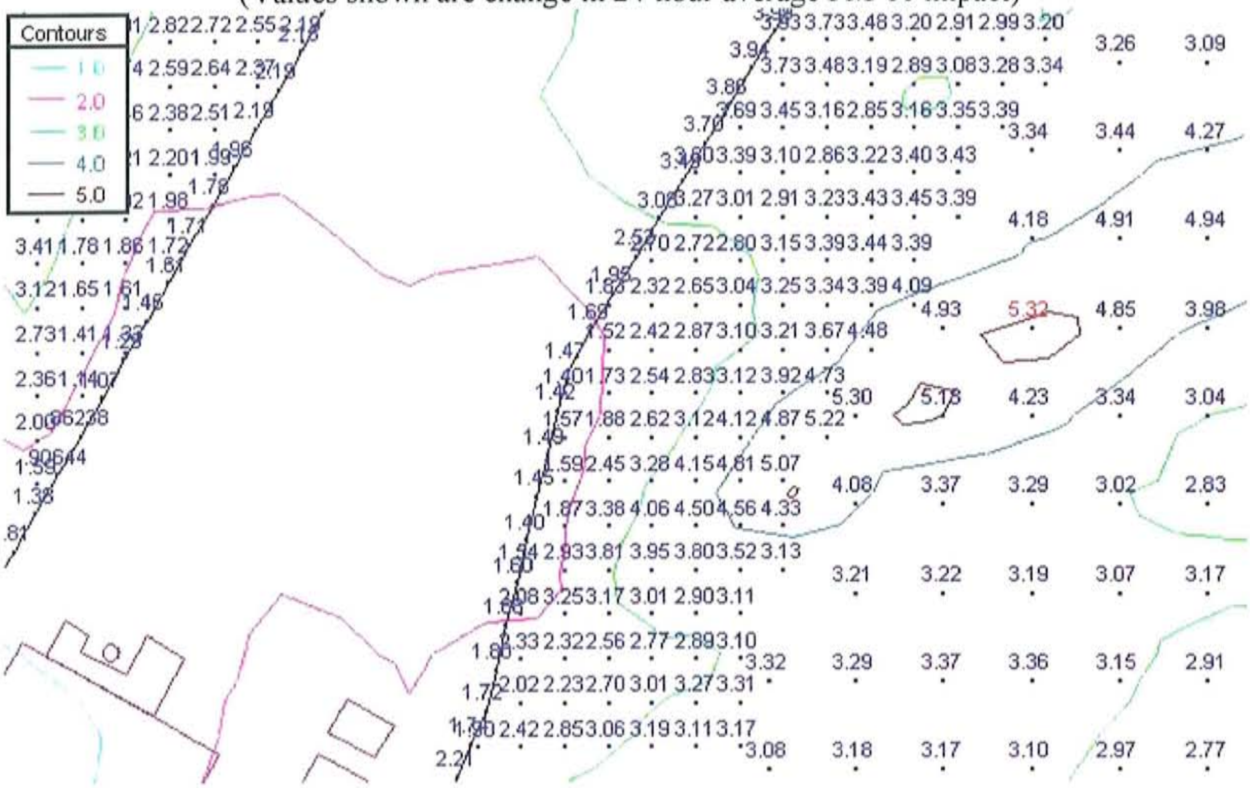
Table 7-10 Air Dispersion Modeling Results Summary

Pollutant / (MET-data Year)	Averaging Period	Result (ug/M^3)	Location (UTME, UTMN)	Background (ug/M^3)	Result + Background (ug/M^3)	IDEQ AAQS Or SIL (ug/M^3)
Facility Impacts (with background, vs. NAAQS)						
SO_2 (1990)	3-Hour	425	15m E of E boundary just E of Bldg 5	34	447	1,300
SO_2 (1989)	24-Hour	104	160m E of boundary, NE of bldgs	26	119.2	365
SO_2 (1991)	Annual	15.8	212m E of boundary, NE of bldgs	8	19.7	80
Change in Facility Impacts (vs. SIL)						
PM-10 (1989)	24-Hour	5.32	160m W of boundary, NW of bldgs	Significant on only two days, entry below shows compliance with NAAQS on those days		5
PM-10 (1990)	24-Hour	68.2	W boundary, alongside plant bldg	73	141.2	150
PM-10 (1991)	Annual	0.65	212m W of boundary, NW of bldgs	-	-	1

The maximum PM-10 increase in 24-hour impact location is shown in Figure 7-5 with the maximum impact in red. The location is 160 meters west of the property boundary northeast of the buildings. This receptor is located in flat terrain. The difference between the value at the maximum impact receptor and its neighboring receptors never approached the difference between the maximum impact value and any applicable standard. The maximum increase in annual PM-10 impact, and the maximum impacts for SO_2 for all but the short 3-hour averaging period occurred in the same vicinity.

Figure 7-5 Location of Most Maximum Impacts

(Values shown are change in 24-hour average PM-10 impact)



7.8 Summary

The modeling results demonstrate that the proposed changes to fuel usage and the increase in fuel oil sulfur content will not result in any exceedances of NAAQS for SO_2, and would result in an insignificant increase in PM-10 impacts. The Radius of Impact (ROI) for SO_2 has been recalculated to reflect any changes potentially resulting from the proposed change.

7.9 TAPs

TAPs do not increase with this proposed action. However, in the next section the TAPs that exceed the EL are analyzed for determining whether the AAC or AACC are exceeded.

8.0 Demonstration of Pre-construction Compliance with Toxic Standards

8.1 TAPs Comparison to Emission Limit / HAP Emissions

Table 8-1 summarizes the TAP emissions and the respective EL thresholds from IDAPA 58.01.01 585 and 586. Non-carcinogens that exceed the EL include cobalt. Carcinogens exceeding the EL are arsenic, beryllium, cadmium, chromium VI, formaldehyde, nickel, and total PAHs.

Table 8-1 TAPs Compared to the EL

NON-CARCINOGENS

Pollutant	Max. Hourly Emissions (lb/hr)	Screening Level (lb/hr)	Modeling? (Y/N)	Emissions (tons/yr)
Antimony	3.4E-03	3.3E-02	N	1.5E-02
Barium	2.1E-03	3.3E-02	N	9.0E-03
Chromium	6.8E-04	3.3E-02	N	2.9E-03
Cobalt	3.9E-03	3.3E-03	Y	1.7E-02
Copper	1.2E-03	6.7E-02	N	5.3E-03
Ethylbenzene	4.1E-05	2.9E+01	N	1.8E-04
Fluoride	2.4E-02	1.7E-01	N	1.1E-01
Hexane	4.2E-01	1.2E+01	N	1.8E+00
Manganese	2.0E-03	3.3E-01	N	8.7E-03
Mercury	4.5E-04	3.0E-03	N	1.9E-03
Molybdenum	6.2E-04	6.7E-01	N	2.7E-03
Naphthalene	7.9E-04	3.3E+00	N	3.4E-03
Pentane	6.0E-01	1.2E+02	N	2.5E+00
Phosphorous	6.1E-03	7.0E-03	N	2.7E-02
Selenium	2.1E-03	1.3E-02	N	9.2E-03
1,1,1 - Trichlorethane (Methyl Chloroform)	1.5E-04	1.3E+02	N	6.7E-04
Toluene	4.4E-03	2.5E+01	N	1.9E-02
o-Xylene	7.1E-05	2.9E+01	N	3.1E-04
Vanadium, V2O5 Respirable Dust and Fume	2.1E-02	3.0E-03	Y	9.1E-02
Zinc	2.2E-02	6.7E-01	N	9.4E-02

CARCINOGENS

Pollutant	Max. Hourly Emissions (lb/hr)	Screening Level (lb/hr)	Modeling? (Y/N)	Emissions (tons/yr)
Arsenic	8.8E-04	1.5E-06	Y	3.8E-03
Benzene	4.9E-04	8.0E-04	N	2.5E-03
Beryllium	4.2E-04	2.8E-05	Y	2.1E-03
Cadmium	5.3E-04	3.7E-06	Y	2.1E-03
Chromium VI	1.6E-04	5.6E-07	Y	8.6E-04
Formaldehyde	2.9E-02	5.1E-04	Y	1.1E-01
Nickel	5.5E-02	2.7E-05	Y	2.4E-01
Benzo(a)pyrene	2.8E-07	2.0E-06	N	3.3E-01
Benz(a)anthracene	2.8E-06	NA	NA	8.2E-05
Benzo(b)fluoranthene	1.1E-06	NA	NA	5.2E-05
Benzo(k)fluoranthene	1.1E-06	NA	NA	2.1E-04
Chrysene	1.7E-06	NA	NA	1.2E-04
Dibenzo(a,h)anthracene	1.2E-06	NA	NA	4.8E-01
Indeno(1,2,3-cd)pyrene	1.6E-06	NA	NA	6.4E-06
Total PAHs	9.7E-06	2.0E-06	Y	4.4E-05

Modeling was conducted for the 24-hour averaging time for the AAC evaluation and the annual averaging time for the AACC evaluation. No scaling factor was applied to the hourly emission rates for the boilers since emissions are based on the maximum hourly fuel usage. Receptors were the same as for the criteria pollutant modeling.

Table 8-2 shows the modeled ambient concentrations, which are compared to the AAC or AACC.

Table 8-2 TAPs Compared to the AAC or AACC (for those exceeding the EL)

Non-Carcinogens			
Pollutant	**Modeled 24-hour µg/m^3**	**AAC µg/m3**	**% AAC**
Cobalt	0.009	2.5	0.4%
Carcinogens			
Pollutant	**Modeled Annual µg/m3**	**AACC µg/m3**	**% AACC**
Arsenic	2.2E-04	2.30E-04	95.7%
Beryllium	8E-05	4.20E-03	1.9%
Cadmium	1.5E-04	5.60E-04	26.8%
Chromium VI	4E-05	8.30E-05	48.2%
Formaldehyde	9.3E-03	7.70E-02	12.1%
Nickel	1.1E-02	4.20E-03	261.9%
Vanadium	1.5E-01	2.5E-00	6.4%
Total PAHs	<1E-05	1.40E-02	<0.1%

For all pollutants compliance is demonstrated assuming 8,760 hours per year of operation on fuel oil, which gives the worst-case hourly emission rate for all TAPs. For nickel, assuming 8,760 hours per year of operation on fuel oil gives an annual concentration of 1.1E-02 µg/m^3, which exceeds the AACC. Because modeling for nickel shows exceedance of the AACC, a cumulative risk analysis was conducted. According to the current Tier II Technical Memorandum (May 29, 2002), as long as the cumulative risk does not exceed the cancer risk by 1×10^{-5} the modeled carcinogen concentrations are acceptable by DEQ. Compliance with the cumulative risk criteria is demonstrated and is further discussed in Section 8.3.

HAPs emissions are shown below in Table 8-3. Idaho Supreme is a minor source for HAPs, as no one pollutant exceeds 10 tpy and facility-wide HAPs emissions do not exceed 25 tpy.

Table 8-3 HAP Emissions

HAPs Inventory	**Emissions**	
Pollutant	**(tons/yr)**	
Arsenic	3.80E-03	
Benzene	2.47E-03	
Beryllium	2.10E-03	
Cadmium	2.07E-03	
Ethylbenzene	1.8E-04	
Formaldehyde	1.08E-01	

HAPs Inventory	Emissions	
Pollutant	**(tons/yr)**	
Chromium	3.80E-03	
Lead	2.25E-01	
Mercury	1.9E-03	
1,1,1 - Trichlorethane (Methyl Chloroform)	6.7E-04	
Naphthalene	3.4E-03	
Nickel	2.41E-01	
Xylene	3.1E-04	
Selenium	9.2E-03	
Toluene	1.9E-02	
POM	3.95E-02	
Dichlorobenzene	5.37E-01	
Phosphorous	2.69E-02	
Hexane	1.75E+00	
Total	**2.98E+00**	

Note: Emission Factors for lead, POM, dichlorobenzene and hexane are as follows (i.e., for those HAPs not included with TAP calculations):

Lead	1.20E-07	lb/gal
	5.00E-04	lb/MMscf
POM	8.82E-05	lb/MMscf
Dichlorobenzene	1.20E-03	lb/MMscf
Hexane	1.8	lb/MMscf

8.2 TAPs Modeling Results

8.2.1 Cobalt Modeling

The facility cobalt sources were modeled for the 24-hour averaging time. The results for cobalt are summarized in Table 8-4 below. All impacts are below AAC; no further cobalt modeling is required.

Table 8-4 Cobalt Modeling Results

Parameter	Maximum Modeled Impacts ($\mu g/m^3$) 24-hour
Concentration	0.007
Background	NA
Total $\mu g/m^3$	0.007
AAC ($\mu g/m^3$)	2.5

8.2.2 Vanadium (V_2O_5) Modeling

The facility vanadium sources were modeled for the 24-hour averaging time. The results for vanadium are summarized in Table 8-51 below. All impacts are below AAC; no further vanadium modeling is required.

Table 8-5 Vanadium (V_2O_5) Modeling Results

Parameter	Maximum Modeled Impacts ($\mu g/m^3$) 24-hour
Concentration	0.158
Background	NA
Total $\mu g/m^3$	0.158
AAC ($\mu g/m^3$)	2.5

8.2.3 Arsenic Modeling

The facility arsenic sources were modeled for the annual averaging time. The results for arsenic are summarized in Table 8-6below. All impacts are below AACC; no further arsenic modeling is required.

Table 8-6 Arsenic Modeling Results

Parameter	Maximum Modeled Impacts ($\mu g/m^3$) Annual
Concentration	1.8E-04
Background	NA
Total $\mu g/m^3$	1.8E-04
AACC ($\mu g/m^3$)	2.3E-04

8.2.4 Beryllium Modeling

The facility beryllium sources were modeled for the annual averaging time. The results for beryllium are summarized in Table 8-7 below. All impacts are below AACC; no further beryllium modeling is required.

Table 8-7 Beryllium Modeling Results

Parameter	Maximum Modeled Impacts ($\mu g/m^3$) Annual
Concentration	7E-05
Background	NA
Total $\mu g/m^3$	7E-05
AACC ($\mu g/m^3$)	0.0042

8.2.5 Cadmium Modeling

The facility cadmium sources were modeled for the annual averaging time. The results for cadmium are summarized in Table 8-8 below. All impacts are below AACC; no further cadmium modeling is required.

Table 8-8 Cadmium Modeling Results

Parameter	Maximum Modeled Impacts (µg/m³) Annual
Concentration	1.4E-04
Background	NA
Total µg/m³	1.4E-04
AACC (µg/m³)	0.00056

8.2.6 Formaldehyde Modeling

The facility formaldehyde sources were modeled for the annual averaging time. The results for formaldehyde are summarized in Table 8-9 below. All impacts are below AACC; no further formaldehyde modeling is required.

Table 8-9 Formaldehyde Modeling Results

Parameter	Maximum Modeled Impacts (µg/m³) Annual
Concentration	9.8E-03
Background	NA
Total µg/m³	9.8E-03
AACC (µg/m³)	0.077

8.2.7 Chromium VI Modeling

The facility chromium VI sources were modeled for the annual averaging time. The results for chromium VI are summarized in Table 8-10 below. All impacts are below AACC; no further chromium VI modeling is required.

Table 8-10 Chromium VI Modeling Results

Parameter	Maximum Modeled Impacts ($\mu g/m^3$) Annual
Concentration	3E-05
Background	NA
Total $\mu g/m^3$	3E-05
AACC ($\mu g/m^3$)	0.000083

8.2.8 Nickel Modeling

Nickel was modeled for the annual averaging time. Assuming 8,760 hours per year of operation on fuel oil gives an annual concentration of 1.1E-02 $\mu g/m^3$, which exceeds the AACC. A cumulative risk analysis was conducted to determine if the cumulative cancer risk exceeds 1×10^{-5} of the cancer risk. The analysis demonstrates compliance with this criteria. The cumulative risk analysis is presented in Section 8.3.

Table 8-11 Nickel Modeling Results

Parameter	Maximum Modeled Impacts ($\mu g/m^3$) Annual
Concentration	1.1E-02
Background	NA
Total $\mu g/m^3$	1.1E-02
AACC ($\mu g/m^3$)	0.0042

8.2.9 PAH Modeling

The facility PAH sources were modeled for the annual averaging time. The results for PAH are summarized in Table 8-12 below. All impacts are below AACC; no further PAH modeling is required.

Table 8-12 PAH Modeling Results

Parameter	Maximum Modeled Impacts ($\mu g/m^3$) Annual
Concentration	<1E-05
Background	NA
Total $\mu g/m^3$	<1E-05
AACC ($\mu g/m^3$)	0.014

8.3 Cumulative Risk Analysis

A cumulative risk analysis was conducted to determine if the cumulative cancer risk exceeds 1×10^{-5} of the cancer risk. The analysis was performed due to the fact that the modeled annual nickel ambient concentration exceeds the AACC. The original Technical Memorandum (May 29, 2002), with respect to Idaho Supreme's current Tier II permit, stated that as long as the cumulative risk does not exceed the cancer risk by 1×10^{-5} the modeled carcinogen concentrations are acceptable. Table 8-13 depicts the analysis.

Table 8-13 Cumulative Risk Analysis

Cumulative Risk Determination					
Toxic	URF (ug/m^3)	AACC (ug/m^3)	Cancer Risk (ug/m^3)	Modeled Concentration (ug/m^3)	Cumulative Risk (ug/m^3)
Arsenic	4.3E-03	2.3E-04	9.89E-07	1.8E-04	7.7E-07
Beryllium	2.4E-04	4.2E-03	1.01E-06	7.0E-05	1.7E-08
Cadmium	1.8E-03	5.6E-04	1.01E-06	1.4E-04	2.5E-07
Chromium VI	1.2E-02	8.3E-05	9.96E-07	3.0E-05	3.6E-07
Formaldehyde	1.3E-05	7.7E-02	1.00E-06	8.6E-03	1.1E-07
Nickel	2.4E-04	4.2E-03	1.01E-06	1.1E-02	2.6E-06
PAH	7.3E-05	1.4E-02	1.02E-06	1.0E-05	7.3E-10
TOTAL			7.03E-06		4.2E-06
CUMULATIVE CANCER RISK DOES NOT EXCEED 1×10^{-5}.					